

An Expanded Perspective on Displacement: A Longitudinal Study of Visitors to Two Wildernesses in the Cascade Mountains of Oregon

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Abstract—Displacement has traditionally been defined as a process in which visitors cease using a recreation site because of sensitivity to crowding or other impacts. This study argues that such a definition is overly narrow: Displacement may also occur when those sensitive to regulation cease using a resource. Evidence for the two types of displacement was collected through self-administered surveys at three Oregon wilderness trailheads in 1991 and 1997. At two areas, use levels and impacts were high in both study periods. At the third, use limits were imposed in 1995, reducing the number of encounters but increasing regimentation. Data from both years on perceptions of crowding and other impacts, support for use limits and visitation patterns provide little evidence that crowding-sensitive users were displaced from high-use destinations. There was substantial evidence that regulation-sensitive users were displaced by the new use limit system. These findings suggest that displacement of those sensitive to crowding may be less common than supposed, while displacement of visitors sensitive to regulation may be more common than previously believed. In high-use areas, some form of displacement is inevitable, and managers must clearly consider and justify which type of user they will displace.

Displacement has been defined as a process in which people move away from places that are changing in ways that they consider unacceptable (Becker 1981). It first became a topic in leisure discussions when researchers (Dustin and McAvoy 1982; Schreyer and Knopf 1984, for example) voiced concerns that high quality experiences dependent on low-density recreation use and concomitant low levels of impact might be endangered by the increasing use levels seen across wildernesses and wild rivers in the 1960s and '70s. These authors feared the homogenization of recreation experiences and advocated maintaining a full range of opportunities to better meet the needs of all citizens. In particular, they were afraid that as managers tried to meet the desires of the less discriminating multitudes by providing amenities and catering to growing numbers, users who sought solitude, self-reliance and low levels of development would be pushed from traditional and preferred sites, and

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left with nowhere to go. Some argued that, in wilderness, the needs and desires of those seeking solitude or experiences most consistent with the Wilderness Act of 1964 (labeled “purists” by some) should be given highest priority (Hendee and others 1968).

This argument has had a significant influence on the practice of wilderness management. Most managers today agree that wilderness serves as an important refuge for increasingly difficult-to-find opportunities for solitude and primitive settings. Thus, they have implemented policies and actions to maintain low levels of use, even when there is little support for this among the general public. This approach was recently given national publicity when managers of the popular Alpine Lakes Wilderness in Washington encountered organized opposition to their proposals to restrict use in order to provide more outstanding opportunities for solitude.

Before endorsing a management approach that seeks to minimize displacement of “purists” seeking experiences most consistent with the ideal described in the Wilderness Act, we feel that two questions should be answered. First, is there empirical evidence that crowding- and impact-sensitive users are displaced by high levels of use, and how substantial is this displacement? Second, is displacement of “wilderness purists” the only, or even the most common, type of displacement? What about users who may be “displaced” by actions taken to maintain resources for the benefit of purists? Although the term displacement has typically been confined to visitors who seek solitude and can no longer find it, there are other types of people, with different needs and desires, who may also be displaced. Perhaps some users value freedom and lack of regulation more than solitude and would be displaced by the imposition of use limits or other regulations. Because these people are affected differently by different courses of action (or inaction), managers need to be aware of their presence and views.

Empirical Evidence of Displacement

Most people probably agree at an intuitive level that displacement of crowding-sensitive users occurs when use levels increase. However, because the techniques typically employed in studies (cross-sectional studies of current visitors) are often insufficient to detect displacement, empirical evidence is rare and inconsistent. For example, panel studies (such as Kuentzel and Heberlein 1992; Shindler 1993) have tended to find that cessation of use is poorly correlated

with perceptions of crowding at the time of initial inquiry. Instead, cessation of use is usually the result of lifestyle changes or changing interests. In other studies (Anderson and Brown 1984, for example), changes in use are inferred to be caused by increasing use, without verification of this assumption by survey respondents. In such cases, other unexplored explanations, such as a desire to explore new areas or increasing skill levels, might better account for changing use patterns. Nevertheless, some studies have found that some visitors sensitive to crowding (or, sometimes, sensitive to resource degradation) use sites less than in the past (Vaske and others 1980) and/or shift to new areas (Shelby and others 1988).

No studies have been undertaken of displacement of those sensitive to regulations. Obviously, many visitors are turned away (displaced) if demand exceeds the limited number of permits, but it is not known how many choose not to apply (and are displaced) simply because of the new regulatory system itself.

Definitions: Two “Types” of Displacement

Our research questions deal with the existence and magnitude of two types of displacement. For purposes of discussion, we define Type 1 displacement as that which occurs because a wilderness is heavily used and impacted. In these areas, visitors who care most about solitude and low levels of impact will presumably be displaced, leaving visitors who are relatively less sensitive to impacts. Visitors who care more about lack of regulation than about solitude should continue to use these sites. We define Type 2 displacement as that which occurs because wilderness is highly regulated. Type 2 displacement will result in the displacement of those who care more about freedom and lack of regulation than about solitude. Visitors who care enough about solitude (and/or low levels of impact) to obtain a limited permit should continue to use or be attracted to the site. We believe that both forms of displacement are likely to occur and that displacement is a constant process, resulting from both management action and inaction.

Study Areas

We conducted longitudinal research (cross-sectional studies of current visitors in 1991 and 1997) at three high-use trailheads in two wildernesses in the Cascades Mountains of Oregon. In 1991, Obsidian Falls trail received approximately 2,970 visitors, who hiked through several miles of montane forest to reach scenic subalpine meadows. Nearly half of this use was by overnight visitors. Green Lakes trailhead provides a shorter trail into an open, spectacular set of lakes. The trailhead is just 30 miles from Bend, Oregon. This is the most heavily used part of Three Sisters Wilderness, with 6,045 visitors in 1991. Marion Lake, in the Mt. Jefferson Wilderness, differs from the other two sites in being entirely forested. It is a popular, easy overnight destination and receives heavy use by anglers. There were approximately 4,300 visitors to Marion Lake in 1991.

Research conducted in 1991 and 1992 indicated that the number of encounters between groups at all three locations

exceeded Forest Plan standards, which called for an 80% chance of seeing 10 or fewer groups in a day (Hall and Shelby 1993). During a typical eight-hour summer day, a visitor would meet an average of about 22 groups at Green Lakes, 14 at Obsidian Falls, and 13 at Marion Lake. As a result of these high encounter rates, managers considered a variety of remedies, ranging from education to use limits. After much public involvement and deliberation, in 1995 they opted to impose use restrictions at Obsidian Falls but not the other two locations.

In 1997, the Obsidian Falls permit system limited use to 20 groups entering the trailhead per day. There was no ceiling on the number of people who could visit, only the number of groups. Visitors were required to obtain a permit at one of two ranger stations, under a first-come, first-served system for both day and overnight users. The regulation was enforced by wilderness ranger patrols and a trailhead host, who spent the first two years in a primarily educational mode. In 1997, enforcement increased, and those without permits were turned away.

Thus, our study examined visitors to three sites that had high levels of use in 1991, two of which continued unregulated and one of which experienced new restrictions. Our objectives were to search for evidence of Type 1 displacement at Green Lakes and Marion Lake and of Type 2 displacement at Obsidian Falls. We also attempted to assess the relative magnitude of each type of displacement. Data were initially collected for other purposes than this study, and survey questions did not specifically target displacement. Despite this limitation, the data do provide a unique opportunity to address important questions of displacement.

Hypotheses

Hypothesis 1 revolves around the changes we would expect between 1991 and 1997 visitors to Green Lakes and Marion Lake if purists were displaced by continued high use. Over time, the composition of users should come to be made up of more impact-tolerant users. Although those who are not sensitive to impacts should continue to use the site as before, any purists who continue to use the site should report using it less over time, and therefore the overall sample of respondents should report using the site less. Use levels may rise at these sites because of an influx of new visitors; combined with the displacement of purists, this means that overall experience levels with the site should decline. Our specific hypotheses that, if confirmed, would provide evidence of Type 1 displacement at Marion and Green Lakes were:

- H1a: There should be a decline between 1991 and 1997 in perceived crowding, holding encounters constant.
- H1b: There should be a decline between 1991 and 1997 in the proportion of visitors reporting that ecological impacts detract from their experience.
- H1c: There should be a decline between 1991 and 1997 in the proportion of visitors who support restrictive management actions, specifically use limits.
- H1d: Visitors in 1997 should report that they come to these areas less often than in the past.
- H1e: The mean number of previous visits to the study sites should decrease.
- H1f: The proportion of first-time visitors should increase.

H1g: Assuming that wilderness “purists” are more experienced generally in wilderness, as has been found in several studies (Manning 1986), the level of overall wilderness experience should decline.

We hypothesized that, if Type 2 displacement occurred between 1991 and 1997 at Obsidian Falls, 1997 visitors would be more tolerant of regulation than 1991 visitors. Obsidian Falls might also appear more attractive to purists in 1997 than 1991, because the new use limits would ensure more solitude. Compared to 1991 respondents then, 1997 users of this site should appear more sensitive to crowding and other impacts. In this case, existing (experienced) users may be displaced by regulation, whereas purists who had formerly avoided the site might begin to visit. Those earlier visitors who still come to the site may come less often because of the regulatory changes. Overall, this means that site-specific experience levels would decline. Because those who oppose regulation are most likely to have been displaced, the 1997 population of visitors should be made up of more regulation-tolerant people than visited in 1991. The specifics of Hypothesis 2 for changes among Obsidian Falls visitors were:

- H2a: There should be an increase from 1991 and 1997 in perceived crowding, holding encounters constant.
- H2b: There should be an increase from 1991 and 1997 in the proportion of visitors reporting that ecological impacts detract from their experience.
- H2c: There should be an increase from 1991 and 1997 in the proportion of visitors who are supportive of restrictive management actions, specifically use limits.
- H2d: Visitors in 1997 who had been visiting since before the regulations took effect should report that they come to this area less often than in the past.
- H2e: The mean number of previous visits to the study site should decrease.
- H2f: The proportion of first-time visitors should increase.
- H2g: Assuming that wilderness “purists” are more experienced generally in wilderness, as has been found in several studies (Manning 1986), the level of overall wilderness experience should increase.

Our final questions concerned which type of displacement is more prevalent. Our null hypothesis was that both types would be equally likely. Thus,

- H3a: The distribution of previous trips at all three areas in 1997 should be the same.
- H3b: The change in number of first-time visitors, between 1991 and 1997, and the number of first-time visitors in 1997 should be equivalent at all three areas.
- H3c: The number of study variables (visitor characteristics and opinions) showing statistically significant changes over time should be the same at all three areas, assuming that such changes indicate a change in users.

Methods

Survey Administration

In 1991, data were collected at the three trailheads using a four-page written questionnaire administered on randomly

sampled days (approximately 10 weekend days and 15 weekdays). All groups exiting the wilderness were approached, and all members were asked to complete the survey. The same strategy was employed in 1997. Response rates ranged from 67 to 79 percent in 1991 (*n*'s 315 to 452) and from 61 to 85 percent in 1997 (*n*'s 155 to 356).

Analysis

Changes between years were assessed using *t*-tests for continuous data and chi-square tests for nominal and ordinal data. For *t*-tests, one-tailed tests were used where hypotheses predicted a directional difference. In tables, one-tailed *p*-values are reported where differences were in the direction suggested by hypotheses; otherwise, two-tailed values are reported.

Results

Because they make reference to the same set of variables, we present evidence for Type 1 and Type 2 displacement together. Our hypotheses predict different results for some variables at the different study areas. Note that any lack of evidence does not mean that displacement did not occur; we just did not find evidence that it had with our methods. We describe results for H3 separately.

Sensitivity to Crowding and Encounters

To evaluate H1a and H2a, we asked respondents to report how many other groups they met on the day we contacted them (encounters), as well as how crowded they felt (nine-point scale). For different numbers of encounters, we computed the proportion of visitors who felt that encounters detracted from their experience (table 1), as well as the linear relationship between number of encounters and sense of crowding (figure 1). There were no statistically significant changes at any of the areas in the proportion of visitors saying encounters detracted from their experience. Results of the regression analysis that modeled crowding as a function of encounters and year indicated no significant change

Table 1—Percent of respondents who felt that encounters detracted from experience, 1991 versus 1997.

| | Number of groups encountered | | |
|-----------------------|------------------------------|------|-----|
| | 0-5 | 6-10 | >10 |
| Green Lakes | | | |
| 1991 | 25 | 23 | 42 |
| 1997 | 15 | 19 | 40 |
| <i>p</i> ^a | .29 | .21 | .69 |
| Marion Lake | | | |
| 1991 | 15 | 12 | 43 |
| 1997 | 6 | 8 | 33 |
| <i>p</i> ^a | .13 | .70 | .43 |
| Obsidian Falls | | | |
| 1991 | 20 | 41 | 55 |
| 1997 | 23 | 40 | 30 |
| <i>p</i> ^a | .90 | .99 | .29 |

^aChi-square test.

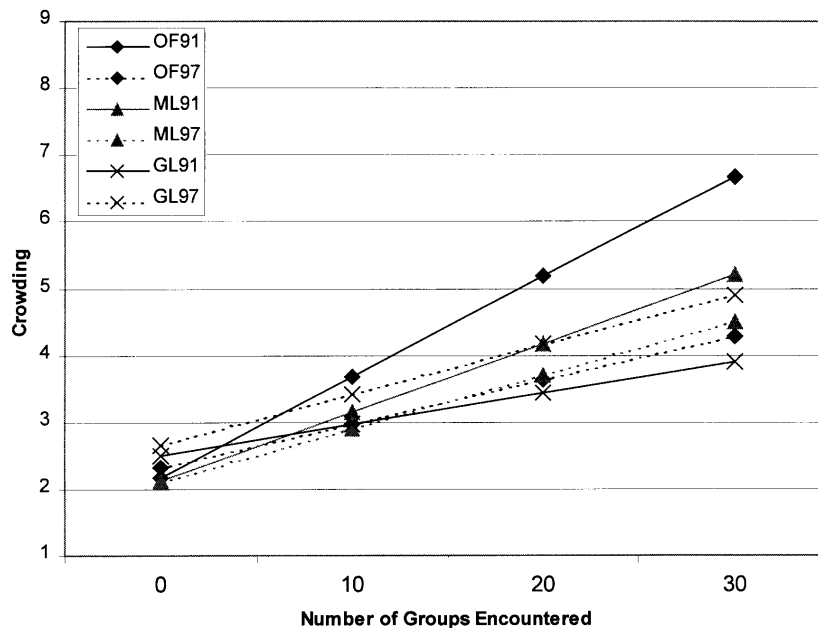


Figure 1—Relationship between encounters and crowding. (Note: difference in slope of regression lines 1991 to 1997: $p = .023$ Green Lakes; $p = .43$ Marion Lake; $p = .14$ Obsidian Falls.)

between years for Marion Lake and Obsidian Falls. There was a significant difference at Green Lakes, but in the direction counter to our hypothesis. Thus, there is no support for H1a or H2a, and therefore no evidence of either Type 1 or Type 2 displacement.

Despite the lack of evidence for H1a and H2a, additional data available from 1997 visitors suggest that Obsidian Falls visitors may be somewhat more sensitive to encounters. Respondents were asked to indicate the maximum number of encounters they would accept in a day in wilderness, if they knew their responses might be used to establish use limits. They could select one of three answers:

- encounters don't matter to me
- encounters matter, but I can't give a specific number
- the maximum acceptable number of groups to meet in a day is _____

The data suggest that, in 1997, Obsidian Falls attracted visitors who were somewhat more sensitive to encounters than users of Marion and Green Lakes (table 2). Fifty-one percent of 1997 Obsidian Falls visitors, but only 29 percent

Table 2—Personal standards for encounters in wilderness, 1997 visitors.

| | Obsidian | Marion | Green |
|--|---------------------|--------|-------|
| | ----- Percent ----- | | |
| Encounters don't matter | 18 | 29 | 37 |
| Encounters matter, but can't give a number | 31 | 42 | 31 |
| Give a number | 51 | 29 | 32 |
| Mean—Maximum acceptable number of encounters | 11.7 | 10.7 | 15.5 |

of Marion Lake visitors and 32 percent of Green Lakes visitors, have a personal standard for encounters. These data are consistent with the hypothesis, but because we do not have comparable data from 1991, we cannot be certain that other factors are not responsible for the observed differences. However, although Obsidian Falls visitors are more likely to consider the number of encounters relevant to their experience, those who have personal standards for encounters do not differ in their evaluations of what is acceptable. Among those with personal standards, visitors to all three areas believe that around 10-15 encounters per day is the maximum acceptable for wilderness.

Sensitivity to Ecological Impacts

To test H1b and H2b, we asked visitors to report whether a variety of physical and ecological impacts from recreation detracted from their experience. They could indicate that they had not noticed an impact or that noticing detracted a lot, a little or not at all. Among those who noticed impacts, there were few significant changes between 1991 and 1997 in the proportion who said impacts detracted from their experience (table 3). Hypothesis 1b was partially supported: Sensitivity to one or three of the eight impacts decreased significantly at Marion and Green Lakes, while there were no significant increases at either of the two locations. This provides some evidence consistent with our expectations for Type 1 displacement. However, our prediction that sensitivity would increase among Obsidian Falls visitors (H2b) was not supported. In fact, for two of the types of impact, visitors displayed a reduction in sensitivity. It is possible that these responses reflect a reduction in impact levels resulting from more intensive management actions in recent years.

Table 3—Percent of respondents who noticed ecological impacts that felt they detracted from the experience, 1997 versus 1991.

| | Green Lakes | | | Marion Lake | | | Obsidian Falls | | |
|------------------------------|-----------------|------|-----------------------|----------------|------|-----------------------|-----------------|------|-----------------------|
| | 1991 | 1997 | <i>p</i> ^a | 1991 | 1997 | <i>p</i> ^a | 1991 | 1997 | <i>p</i> ^a |
| | ---- Percent -- | | | --- Percent -- | | | --- Percent --- | | |
| Trails worn or too wide | 49 | 51 | .51 | 50 | 47 | .58 | 57 | 52 | .51 |
| Many side trails | 64 | 50 | .004 | 61 | 53 | .18 | 65 | 57 | .26 |
| Vegetation loss at campsites | 76 | 59 | .002 | 73 | 70 | .57 | 79 | 65 | .02 |
| Tree damage | 63 | 44 | .005 | 80 | 66 | .01 | 71 | 62 | .27 |
| Erosion of shorelines | 75 | 64 | .11 | 63 | 65 | .89 | 77 | 73 | .70 |
| Litter | 75 | 66 | .23 | 86 | 80 | 1.00 | 77 | 71 | .40 |
| Human waste | 56 | 42 | .28 | 67 | 68 | 1.00 | 67 | 33 | .01 |
| Horse manure | 73 | 77 | .15 | 75 | 72 | .46 | 75 | 68 | .12 |

^aChi-square test.

Table 4—Opinions about the need for use limits.

| | Limit use now | Do not limit use now | <i>p</i> ^a |
|-----------------------|---------------------|----------------------|-----------------------|
| | ----- Percent ----- | | |
| Green Lakes | | | |
| 1991 | 37 | 63 | |
| 1997 | 28 | 72 | .006 ^a |
| Marion Lake | | | |
| 1991 | 22 | 78 | |
| 1997 | 27 | 73 | .12 |
| Obsidian Falls | | | |
| 1991 | 40 | 60 | |
| 1997 | 59 | 41 | <.0005 |

^aChi-square test.

Support for Use Limits

Hypotheses 1c and 2c concern support for restrictive management policies. To evaluate these hypotheses, we asked visitors whether they felt restrictions were needed on the number of people visiting the study areas. They could indicate that use should be limited now (either by reducing or capping use levels), that no limits are needed now but might be in the future, or that no limits should ever be imposed. We predicted (H2c) that Obsidian Falls users would show an increase in support for regulations between 1991 and 1997, because regulation-sensitive users would have been displaced, while Green Lakes and Marion Lake users would show an even lower level of support for regulation (H1c). In 1991, use limits were not supported by a majority of visitors in any of the three areas (table 4). In 1997, use limits were still not supported at Green or Marion Lakes, but a majority did support them at Obsidian Falls, where they had been implemented. Thus, Hypothesis 2 was supported, and Hypothesis 1 was supported at Green Lakes but not Marion Lake.

Further evidence of support for limits is available from a question presented to Obsidian Falls users in 1997. The majority of these visitors said that limits should be continued. About 75 percent of visitors supported continuing limits, even though in 1991, 60 percent had said that no use limit system was needed at that time. When asked how the limits affected their enjoyment, 68 percent of day and 57 percent of overnight respondents said the permit system enhanced their experience, while only 29 percent of day and

26 percent of overnight visitors said it detracted. The remainder said it had no effect on their experience. These data are consistent with H2, which predicts displacement of regulation-sensitive users. However, it is also possible that they reflect a change in the opinions of visitors when they are actually exposed to use limits.

Experience With This Place

Several questions asked about visitors' past use of the study area. First, we asked respondents to tell us how they had changed their use of the study site since 1991. Only those who had been coming to the site before that time responded to this question. Most people at each area said their use of the area had not changed (table 5). At Obsidian Falls, however, users were three times as likely to say they visited less than in the past than to say they visited more. At Green Lakes and Marion Lake, equal proportions of users gave each of these responses. This is consistent with H2d but not H1d, providing evidence of Type 2 displacement but not Type 1. It is not possible to know whether Obsidian Falls users visited less because they could not get a permit or because the system itself deterred them from trying. Information from the Forest Service indicated that not all permits were used (weekday slots were often available), so it is possible that many long-term visitors were displaced by the regulatory regime.

The mean number of past trips to the study sites decreased dramatically between 1991 and 1997 at Obsidian Falls, supporting H2e and providing evidence of Type 2 displacement (table 6). The only support for H1e, that the mean number of previous trips would decline at Marion and Green Lakes, came from changes in day users at Marion Lake.

Table 5—Self-reported changes in use of the study trail between 1991 and 1997.

| | Green (<i>n</i> = 68) | Marion (<i>n</i> = 90) | Obsidian (<i>n</i> = 25) |
|-----------------------|---------------------------|----------------------------|------------------------------|
| | ----- Percent ----- | | |
| Use more than in past | 19 | 20 | 12 |
| Use same as in past | 62 | 59 | 52 |
| Use less than in past | 18 | 21 | 36 |

Chi square test, *p* = .02.

Table 6—Mean number of previous trips to study site.

| Length of stay | | 1991 | 1997 | p ^a |
|----------------|-----------|------|------|----------------|
| Green Lakes | Day | 2.7 | 3.1 | .44 |
| | Overnight | 2.7 | 2.0 | .15 |
| Marion Lake | Day | 12.0 | 4.1 | .005 |
| | Overnight | 4.1 | 8.2 | .09 |
| Obsidian Falls | Day | 5.5 | 1.4 | .003 |
| | Overnight | 2.7 | 1.5 | .02 |

^aT-test (one-tailed probability).

More evidence for Type 2 displacement comes in testing H2f. The proportion of first-time visitors increased markedly at Obsidian Falls (table 7). However, the proportion of first-time visitors did not increase at Green or Marion Lakes. Once again, the evidence for Type 1 displacement is lacking.

General Wilderness Experience

A number of studies, reviewed in Manning (1986), report that wilderness purists tend to have more general experience in wilderness than those more tolerant of impacts and encounters. Therefore, if both types of displacement are occurring, we would expect experience levels to decline at Green and Marion Lakes (H1g) and increase at Obsidian Falls (H2g). Specifically, we asked questions about the mean number of other wildernesses visited by respondents and their frequency of trips to wilderness, in 1991 and 1997. We found no support for either hypothesis. The only statistically significant change was an increase in the experience of day users at Green Lakes, a result counter to expectations (table 8).

Which Displacement Type Was More Pronounced?

Our third hypothesis was built around the expectation that the extent of displacement could be assessed through examination of changes in several variables. We consider displacement to be most pronounced in the place where 1) prior experience with that place decreased most, 2) the number of first-time visitors increased most and 3) more visitor characteristics changed significantly. Any of these findings would suggest that there has been a greater

Table 7—Percent of respondents on first trip to study site.

| Length of stay | | 1991 | 1997 | p ^a |
|----------------|-----------|------|------|----------------|
| Green Lakes | Day | 48 | 49 | .77 |
| | Overnight | 51 | 53 | .81 |
| Marion Lake | Day | 42 | 48 | .36 |
| | Overnight | 38 | 35 | .53 |
| Obsidian Falls | Day | 33 | 61 | .001 |
| | Overnight | 44 | 58 | .04 |

^aChi-square test.

turnover in the people who visit the area. From table 6, it is clear that the mean number of previous trips to the study site decreased substantially at Obsidian Falls: 75 percent for day visitors and 44 percent for overnight visitors. There were no significant decreases at Green Lakes. Contrary to expectations, the number of previous trips by Marion Lake overnight users increased, although not enough to be statistically significant. Number of previous trips by day users at Marion Lake decreased significantly, consistent with displacement, but still was higher in 1997 than at the other two places. In 1997, mean number of previous trips was lower at Obsidian Falls than at the other two areas. Therefore, we reject the null hypothesis H3a and suggest that Type 2 displacement may have been more pronounced than Type 1 displacement in these areas.

The proportion of visitors on their first visit to the study site increased dramatically at Obsidian Falls (table 7). There were 85 percent and 32 percent increases in the proportion of day and overnight visitors, respectively, taking their first visit to Obsidian Falls. In contrast, there were no substantial increases in first-time visitors at Green or Marion Lakes. Moreover, in 1997, first-time visitors were much more prevalent at Obsidian Falls than at the other two areas, despite the fact that, in 1991, first-time visitors were least prevalent at Obsidian Falls. Null H3b is rejected, providing further evidence that Type 2 displacement has been more pronounced than Type 1 displacement. Particularly among day users, Obsidian Falls visitors have shifted from being experienced repeat visitors to the area to primarily first-time visitors.

There is also some evidence that 1997 visitors were more different from 1991 visitors at Obsidian Falls than at the other areas. As previously described, the magnitude of changes in opinions about use limits and previous use of the study site were highest at Obsidian Falls. Other data we collected (not presented), indicate that the proportion of overnight visitors staying out one night, rather than more nights, increased much more at Obsidian Falls than elsewhere. The average group size of overnight groups also increased much more at Obsidian Falls than elsewhere. No visitor characteristic variables changed substantially more at Green and Marion Lakes than at Obsidian Falls. This provides admittedly limited evidence that null H3c should be rejected and that Type 2 displacement is more pronounced than Type 1 displacement. If we had included a wider range of sociodemographic variables on the questionnaire, we would have been in a stronger position to evaluate this hypothesis.

Table 8—Mean number of other wilderness areas visited.

| Length of stay | | 1991 | 1997 | p ^a |
|----------------|-----------|------|------|----------------|
| Green Lakes | Day | 10.5 | 14.9 | .002 |
| | Overnight | 9.7 | 10.1 | .79 |
| Marion Lake | Day | 13.5 | 11.8 | .25 |
| | Overnight | 6.7 | 8.8 | .18 |
| Obsidian Falls | Day | 11.1 | 8.5 | .17 |
| | Overnight | 10.0 | 13.7 | .10 |

^aT-test (one-tailed probability).

Discussion

At Green and Marion Lakes, we found very little evidence of Type 1 displacement, the traditional type in which visitors sensitive to crowding and impacts are displaced by increasing use and managerial inaction. Evidence we had expected to find included 1) decreased sensitivity to crowding, 2) decreased sensitivity to ecological impacts, 3) decreased support for regulation (specifically use limits), and 4) decreased experience both with the specific study site and with wilderness in general. The only evidence we found was decrease in support for use limits (but only at Green Lakes), a decrease in number of previous trips to the study site (but only among Marion Lake day users) and a decrease in the proportion of visitors who stated that some types of ecological impacts adversely affected their experience. However, it is possible that the latter finding resulted from a decrease in impact levels rather than a reduced sensitivity to impacts. For example, between 1991 and 1997, managers implemented campfire restrictions, a designated campsite program and site restoration at Green Lakes.

Despite this lack of strong evidence for Type 1 displacement, we must acknowledge that other measures might have uncovered stronger evidence of displacement. Thus, our negative findings do not “prove” that Type 1 displacement did not occur. More important, our study only looked for evidence of displacement between 1991 and 1997. Green and Marion Lakes were both heavily used in 1991 and substantial displacement may have occurred before then.

In contrast, we found strong evidence for Type 2 displacement at Obsidian Falls, where use limits were established between 1991 and 1997. This type of displacement is the previously ignored type, in which users sensitive to regulation and/or unwilling or unable to obtain a permit are displaced by regulation. Evidence we had expected to find included 1) increased sensitivity to crowding, 2) increased sensitivity to ecological impacts, 3) increased support for regulation, and 4) decreased experience at the specific study site but increased experience with wilderness in general. Consistent with expectations, at Obsidian Falls we found dramatic increases in support for regulations and decreases in prior use of the study site. Most visitors were first-time users and many long-term users visit the area less often than in the past. However, we did not find increases in sensitivity to crowding or to ecological impacts or increases in overall wilderness experience.

In addition to finding more evidence of Type 2 displacement than of Type 1, the magnitude of Type 2 displacement appears to have been much greater than Type 1. Between 1991 and 1997, many more people appear to have been displaced from Obsidian Falls by use limits than were displaced from Green and Marion Lakes by increasing use and/or deteriorating conditions resulting from lack of restriction.

Two potential reasons for these findings that we have already mentioned are 1) that our methods were inadequate to find evidence of Type 1 displacement and 2) that we looked for evidence of Type 1 displacement after it had already occurred. A third possibility is that Type 2 displacement is more pronounced than Type 1 displacement because more visitors care more about regulations than about crowding or impacts. This is consistent with our finding that current

Obsidian Falls visitors are better characterized by their acceptance of regulation than by an increased sensitivity to crowding and impacts. It is underscored by our finding that Obsidian Falls visitors are more likely than visitors to Green or Marion Lakes to say that the number of people they encounter affects their experience, but they do not differ in their evaluation of how many encounters are acceptable (table 2). That is, Obsidian Falls visitors appear more aware that encounters are an issue and perhaps are more tolerant of restriction as a result. But these more aware users are not more sensitive to a given number of encounters or impacts and, therefore, probably should not be considered “purists.”

Management Implications

We suggest that the traditional definition of the displacement concept – a process in which recreationists are driven away from a preferred place due to conditions becoming too crowded and/or impacted – is overly narrow and has focused on meeting the needs of one segment of the visitor public while ignoring how other segments might be affected. Consequently, managers and researchers have typically judged displacement as inherently bad and something in need of redress. We suggest that displacement should be given a more generic, balanced definition, as a process in which recreationists are driven away from a preferred place due to changes in conditions resulting from management action or lack thereof. Using this definition, it is clear that displacement must be a constant and inevitable process anywhere use/impact levels are high or increasing or where restrictive management actions have been taken. In our study area, over the six-year time frame we examined, displacement as a result of increased restriction (at Obsidian Falls) was more pronounced than the displacement of visitors as a result of increased crowding/impact (at Green Lakes and Marion Lake).

Considering displacement from this broader perspective should caution managers not to think of one form as necessarily better or worse than another. In the types of settings we have described, some visitors will be displaced, regardless of what managers do or fail to do. In this context, the question is whether the group that is being driven away is the group that managers want to drive away. It is no longer a question of how to solve the “problem” of displacement once and for all. Managers must make a subjective judgement about the conditions they want to provide (for example, low density-highly restrictive or higher density-unconfined) and which clientele they will favor (purists or nonpurists, regulation-tolerant or regulation-averse). Managers who do not confront this question directly are still favoring one group or another because even inaction will result in displacement.

Managers must make these subjective judgements based on a thorough analysis of regional supply and demand for different recreational opportunities, along with consideration of natural resource preservation needs. Managing displacement entails considering where people go, and where they can find the experiences they desire. This should draw managers’ attention to regional issues, something that is rarely done. Surveys of current visitors at individual sites are of little utility in this regard because current visitors almost inevitably support the existing management regime.

For example, most visitors to all three of our study areas felt, in 1991, that use levels should not be capped or reduced at that time. In 1997, this remained the opinion of visitors at Green Lakes and Marion Lake, where use remained unlimited. However, most of the 1997 visitors to Obsidian Falls (mostly first-time visitors) supported the use-limitation program that had been implemented. Without replication over time, we would have been unable to detect this change and would have concluded, as usually is done, that current visitors are satisfied with conditions and management.

The possibility that regulation is more relevant and important to visitors than solitude and impacts is an intriguing thought. Perhaps the imposition of regulations favors a regulation-tolerant clientele rather than purists and displaces purists as well as those intolerant of regulation. More pleasant to consider is the possibility that the restrictions implemented at Obsidian Falls simply were not restrictive enough and did not create enough improvement to appeal to purists. This would be consistent with evidence that use levels must be reduced to very low levels before any significant improvement in conditions is possible (Cole and others 1997).

Our data do not allow us to judge among these various possibilities. All we can conclude is that the major change at our study sites, between 1991 and 1997 when use limits were established at Obsidian Falls, was displacement of many visitors from Obsidian Falls. These users were replaced by visitors better characterized as regulation-tolerant than as purist or sensitive to such wilderness attributes as solitude and natural conditions. Conventional wisdom that purists will be favored by use limits and that visitors will adapt to use limits may be overgeneralizations. In our study, we found little evidence of changes in the prevalence of purist sentiments, even where use limits were implemented. We also found that some visitors do adapt to use limits, but many others do not and are displaced or discouraged from visiting.

Although some crowding-sensitive users undoubtedly avoid high-use destinations, this tendency was not widespread in our study. Instead, it seems likely that crowding-sensitive visitors go to low-use areas when seeking solitude; they still may enjoy these unique, high-use destinations for different experiences. They may also come to these sites at different times, without avoiding them altogether. This conclusion is consistent with other research we have conducted on displacement at a high-use developed recreation setting (Hall and Shelby 1999). There, a large percentage of visitors said they adjusted to high-use conditions by visiting at different times of the year or week. Although this is a form of displacement (temporal), these users are not completely shut out from their desired resource, as the traditional displacement hypothesis sometimes suggests.

The displacement concept was originally advanced as an *explanation* for the poor correlation between use density/crowding and satisfaction/experience quality. This explanation has inherent appeal and is probably valid. In crowded places, those who are highly sensitive to crowding may be displaced to less crowded places or times, so the remaining visitors (the population captured in surveys) lack the highly sensitive visitors for whom a correlation between density and satisfaction should be most pronounced. However, once advanced as an explanation, displacement became described

as a *process*, which typically has been considered to be inherently undesirable. We feel this is inappropriate because visitors are only considered displaced if increased crowding/impacts drove them away. Visitors should also be considered displaced if a place has become too lonely for their taste, if trails have disappeared, if use limits have forced them to go elsewhere, or if a restrictive management regime has driven them away. Moreover, referring to traditional displacement as inherently bad interjects the value judgment that visitors who need uncrowded conditions should be preferred over those who need unrestricted, free and spontaneous recreation opportunities. It may be appropriate to take actions that would maintain low-density recreation opportunities, particularly in wilderness. However, it is important to make this decision explicit, to recognize that the basis for this decision is subjective (not based on objective science) and that it will favor one group of visitors (wilderness purists) and displace others (those visitors who desire unrestricted recreation opportunities).

This leads us to conclude by recommending that managers of high-use wilderness areas clearly state their objectives and the types of experiences they intend to provide. We can think of three fundamentally different choices managers can make. First, they may choose to minimize the total number of people who will be displaced by their management program. Our results suggest that this position would lead managers of high-use areas to continue a regime characterized by high use and low levels of regulation, because more people are displaced by use limits than by crowding. In some areas, this may be a desirable approach. However it is unlikely to be appropriate everywhere, particularly in more lightly used places.

Second, managers may choose to favor purists – those sensitive to crowding and impacts. We feel that this option is problematic in high-use areas, because the Wilderness Act calls for both solitude and primitive, unconfined recreation. That is, wilderness visitors should be able to enjoy both outstanding opportunities for solitude and freedom from restrictions. Our data suggest that it is impossible to achieve both objectives at high-use wilderness destinations. Moreover, radical reductions in use would be needed to precipitate enough change to make areas attractive to purists.

Finally, managers may choose to set different policies for different wildernesses, or parts of wildernesses, as advocated by planning frameworks such as ROS and LAC. In a regional context, this may mean minimizing Type 1 displacement in some areas and Type 2 displacement in others. High-use wildernesses need not all have identical policies, as tends to be the case today, when many wildernesses share the same indicators and standards for experience quality. The wildernesses in the Cascades Mountains offer a good case in point. In Oregon and Washington, all of the large snow-covered volcanic peaks are in federally designated wilderness. They could provide a wide range of opportunities for diverse user groups. If one consistent policy is used to govern all these wildernesses, one group will be favored in all areas, to the detriment of all other wilderness user groups.

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